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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/549,762

09/19/2005

Shinji Kawasaki

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BURR & BROWN

PO BOX 7068

SYRACUSE, NY 13261-7068

EXAMINER

ROBINSON, LAUREN E

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/549,762	Applicant(s) KAWASAKI ET AL.	
	Examiner LAUREN ROBINSON	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 6 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 December 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12, 13 and 15-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12, 13 and 15-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 12, 16, 18 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by McArdle et al. (US Publication No. 20020066233).

McArdle et al. teach ceramic aggregate particles comprising a plurality of solid particulates such as silicon carbide (Par. 0028) bound together by silicon nitride (Par. 0022). The reference discloses that the silicon nitride binding material improves porosity in between the particles (Par. 0035) and therefore must be present between the particles. Also, since the silicon nitride is between each particle and there are pores present between the silicon carbide particles, then it is inherent that the silicon nitride surface defines said pores. McArdle et al. also teach that if the material is a bonded abrasive product, then it can be 70% by volume pores (porosity of 70%) (Par. 0111) and it is the examiner's position that since the reference does not disclose that silicon nitride binder is comprised of columnar silicon nitride, then columnar silicon nitride is present on the surface defining said pores (**Claim 12**). Also, the reference teaches that the

materials can have a pore diameter ranging from 0.07 to about 900 micrometers (Par. 0206) (**Claim 16**).

Also, it is the examiner's position that due to the materials and structure being the same in the reference as in the applicants' disclosure, the characteristics of has a heat resistance temperature of 1200 degrees Celsius or more and a gas permeability of 1 micron² would be inherent (**Claims 18 and 20**).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 13, 15, and 17, 19 and 21 are rejected under 35 U.S.C. 103(a) as being obvious over McArdle et al. (US Publication No. 20020066233) in view of Kuramochi et al. (US Patent No. 6,328,64).

McArdle et al. teach ceramic aggregate particles comprising a plurality of solid particulates such as silicon carbide bound together by silicon nitride (Pg. 2, Col. 1, Par. 0022) wherein pores are then formed between the particles. They also teach that the material can be made by heating at a temperature in between 1200 to 1832 degrees

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Celsius (Par. 0167) and it is used as an abrasive product as discussed above or polishing products (Par. 0108). However, McArdle et al. are **silent with regard to the specific surface area of the said pores, the heat resistant temperature, and gas permeability of the material.**

Regarding claim 13:

Kuramochi et al. teach a molded abrasive product (abstract) wherein the product is comprised of an inorganic particle component (Col. 4, lines 1-10) and a binder (Col. 7, lines 25-35). The product is taught to be porous (Col. 4, lines 39-50). Furthermore, they teach that the overall product has a BET specific surface area of from 0.1 to 100 m²/g (Col. 3, lines 63-67) and the pores have a pore size of from 1 to 360 microns and an open porosity of 10 to 70 % (Col. 6, lines 4-10). The reference teaches that when the product is used as a polishing product, it has the above specific surface area in order to polish more efficiently while maintaining the strength of the product (Col. 3, lines 20-57 and Col. 1 5, lines 27-41).

McArdle et al. and Kuramochi et al. disclose analogous inventions regarding an abrasive product used in polishing products wherein the product is a porous material comprised of inorganic particles and a binder. Furthermore, both products have a pore size of between 1 to 360 microns and a porosity of 70%. As such, it would have been obvious to one of ordinary skill in the art at the time of inventions to modify the polishing product of McArdle et al. to include the teaching of Kuramochi et al. which includes that the product can have a specific surface area of between 0.1 to 100 m²/g in order to polish more efficiently and to have increased strength.

The examiner notes that while the specific surface area taught above is for the entire structure, due to the pores being within the structure then it is inherent that the pore specific surface area would be smaller than the overall specific surface area. Furthermore, since the overall area can be that of $0.1 \text{ m}^2/\text{g}$ and the pore surface area would be smaller as discussed above, then the above modification would now correspond to applicants' claim 13.

Regarding claims 15 and 17:

The examiner notes that as discussed above, McArdle et al. teach that the material has an average pore size of 0.07 to 900 microns and a porosity of 70%.

Regarding claims 19 and 21:

The examiner notes that as discussed above, the material in McArdle et al.'s teaching is produced by heating at a temperature in between 1200 and 1832 degrees Celsius and this is in order to cause a change in density in the structure caused by the melting of the binding material (Par. 0167).

The examiner notes that as discussed above, heat resistance is defined as the ability to resist deterioration effects of elevated temperatures such as melting and phase change within the structure and due to the teaching needing an elevated temperature of above 1200 degrees Celsius to obtain a change in structure, it is the examiner's position that the structure material inherently has a heat resistance temperature of above 1200 degrees Celsius (**Claim 19**).

Furthermore, as also discussed above, due to the materials and structure, including pore size, specific surface area porosity, and temperature resistance is the same in McArdle et al. teaching as it is claimed by the applicants, it is the examiner's

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position that gas would flow through the structure at the same rate as the applicants' structure. Therefore, it is the examiner's position that due to the modified teaching of McArdle et al. teaching a structure that corresponds to the applicants, then the characteristic of being gas permeably at 1 micron² or more would be inherent(Claim 21).

Response to Arguments

Applicant's arguments filed December 18, 2007 have been fully considered but they are not persuasive.

Regarding argument 1: The applicants argue that McArdle et al. does not disclose a porosity of more than 40% and that the improved porosity is related to the decreasing of the pores. While the examiner agrees that the binder material around the particles would decrease the pores, the examiner disagrees with the applicants' argument that the maximum porosity is 40%. While they do disclose this value, the reference indicates that when the material is used as an abrasive product, then the porosity can reach 70% which can be found in paragraph 0111. Therefore, the examiner notes that the applicants' argument has been fully considered but is not persuasive.

Regarding argument 2: The applicants' argue that the claim as amended has to have the silicon nitride directly bonded to the silicon carbide particles and that the PTO asserts that the only reason for combining the reference of McArdle et al. and Ohno et al. was due to an alumina layer coating the particles and due to the amendment of claim 13, the applicants' request that this rejection should be withdrawn. The examiner has fully considered this argument and agrees that this rejection should be withdrawn. While the examiner notes that the teaching of McArdle et al. discloses that the alumina can be

present but doesn't have to be, the examiner's sole purpose for combining the references was that the structure was the same when alumina was present. The examiner notes that the claim as amended requires that no alumina be present and while McArdle et al. still relates to this claim, there is now no reason to combine the teaching of Ohno et al. and therefore, the previous rejection is withdrawn. However, the rejection present above which was necessitated by the applicants' amendment now applies.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lauren E.T. Robinson whose telephone number is (571)

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270-3474. The examiner can normally be reached on Mon. through Fri. 7:30 to 5:00 EST (First Fri Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney at (571)272-1284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Gwendolyn Blackwell/
Primary Examiner, Art Unit 1794

Lauren E. T. Robinson
Examiner
AU 1794

/LAUREN ROBINSON/
Examiner, Art Unit 1794